



AGU Fall 2008  
A511-0225

# New Collections of Aura Atmospheric Data Products at the GES DISC

<http://disc.gsfc.nasa.gov/Aura>

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## GES DISC Aura Products:

The NASA Goddard Earth Sciences Data and Information Services Center (GES DISC) is the primary archive of atmospheric composition data from the Aura Ozone Monitoring Instrument (OMI), Microwave Limb Sounder (MLS), and High-Resolution Dynamics Limb Sounder (HIRDLS) instruments. The most recent versions of Aura OMI, MLS and HIRDLS data are available free to the public (<http://disc.gsfc.nasa.gov/Aura>). TES data are at ASDC (<http://eosweb.larc.nasa.gov>).

OMI	Short Name	Product Types
Aerosol Optical Thickness and Single Scattering (Multi-Wavelength)	OMAERO	L2, L2G, L3e
Aerosol Extinction and Absorption Optical Depth (Near-UV)	OMAERUV	L2, L2G, L3d
Effective Cloud Pressure and Fraction (O <sub>2</sub> -O <sub>2</sub> Absorption)	OMCLD02	L2, L2G
Effective Cloud Top Pressure and Fraction (Rot. Raman Scattering)	OMCLDRR	L2, L2G
Ozone (O <sub>3</sub> ) DOAS Total Column	OMDOAO3	L2, L2G, L3e
Ozone (O <sub>3</sub> ) Total Column	OMT03	L2, L2G, L3d, L3e
Ozone Tropospheric Column	OMTROO3	L2
Ozone Profile ("coming soon")	OMO3PR	L2
Nitrogen Dioxide (NO <sub>2</sub> ) Total & Tropospheric Column	OMNO2	L2, L2G, L3e
Sulfur Dioxide (SO <sub>2</sub> ) Total Column	OMS02	L2, L2G*
Bromine Monoxide (BrO) Total Column	OMBRO	L2
Formaldehyde (HCHO) Total Column G	OMHCHO	L2, L2G
Chlorine Dioxide (ClO) Slant Column	OMOCLO	L2
Surface UV Irradiance	OMUVB	L2
Surface Reflectance Climatology (10/2004 - 10/2007)	OMLER	L3
Level 1B Solar Spectral Irradiances	OML1BIRR	L1B
Level 1B UV Global Geolocated Earthshine Radiances	OML1BRUG	L1B
Level 1B UV Zoom-in Geolocated Earthshine Radiances	OML1BRUZ	L1B
Level 1B VIS Global Geolocated Earthshine Radiances	OML1BRVG	L1B
Level 1B VIS Zoom-in Geolocated Earthshine Radiances	OML1BRVZ	L1B

L2G = 0.25°x0.25° (except OMS02 = 0.125°x0.125°); L3d = 1.00°x1.00°; L3e = 0.25°x0.25°

MLS	Short Name	Product Types
Bromine Monoxide (BrO) Mixing Ratio	ML2BR0	L2 V002 & V001
Methyl Cyanide (CH <sub>3</sub> CN) Mixing Ratio	ML2CH3CN	L2 V002
Chlorine Monoxide (ClO) Mixing Ratio	ML2CLO	L2 V002 & V001
Carbon Monoxide (CO) Mixing Ratio	ML2CO	L2 V002 & V001
Geopotential Height	ML2GPH	L2 V002 & V001
Water Vapor (H <sub>2</sub> O) Mixing Ratio	ML2H2O	L2 V002 & V001
Hydrogen Chloride (HCl) Mixing Ratio	ML2HCL	L2 V002 & V001
Hydrogen Cyanide (HCN) Mixing Ratio	ML2HCN	L2 V002 & V001
Nitric Acid (HNO <sub>3</sub> ) Mixing Ratio	ML2HNO3	L2 V002 & V001
Hydroperoxy (HO <sub>2</sub> ) Mixing Ratio	ML2HO2	L2 V002 & V001
Hypochlorous Acid (HOCl) Mixing Ratio	ML2HOCL	L2 V002 & V001
Cloud Ice Product	ML2WC	L2 V002 & V001
Nitrous Oxide (N <sub>2</sub> O) Mixing Ratio	ML2N2O	L2 V002 & V001
Ozone (O <sub>3</sub> ) Mixing Ratio	ML2O3	L2 V002 & V001
Hydroxyl (OH) Mixing Ratio	ML2OH	L2 V002 & V001
Relative Humidity With Respect to Ice	ML2RHI	L2 V002 & V001
Sulfur Dioxide (SO <sub>2</sub> ) Mixing Ratio	ML2SO2	L2 V002
Temperature	ML2T	L2 V002 & V001
Diagnostics, Geophysical Parameter Grid	ML2DGG	L2 V002 & V001
Diagnostics, Miscellaneous Grid	ML2DGM	L2 V002 & V001
Orbit/Altitude and Tangent Point Geolocation Data	ML1OA	L1 V002 & V001
Radiances from Digital Autocorrelators	ML1RADDD	L1 V002 & V001
Radiances from Filter Banks for GHz	ML1RADG	L1 V002 & V001
Radiances from Filter Banks for THz	ML1RADT	L1 V002 & V001

V002 = Aug 2004 - current; V001 = Aug 2004 - Jan 2007

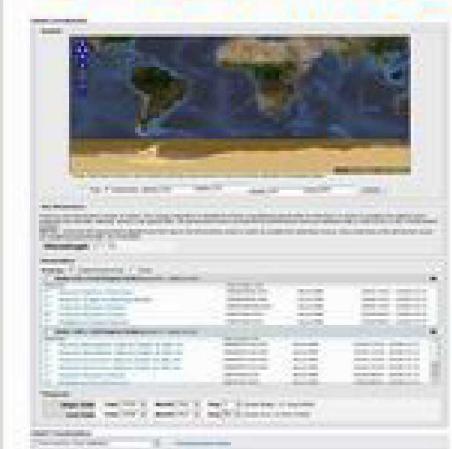
HIRDLS	Short Name	Product Types
CFC-11 (CF <sub>3</sub> Cl) Mixing Ratio	HIRDLS2	L2 V004
CFC-12 (CF <sub>2</sub> Cl <sub>2</sub> ) Mixing Ratio		X
Nitric Acid (HNO <sub>3</sub> ) Mixing Ratio		X X
Ozone (O <sub>3</sub> ) Mixing Ratio		X X
Temperature		X X
Cloud Top Pressure		X X
Aerosol Extinction at 12.1 μm		X
Calibrated Geolocated Radiances Corrected for Obstruction (Not Public)	HIRDLS1C	L1 V004

V004 (2.04 15) = Jan 2005 - Jan 2008; V003 (2.04 09) Jan 2005 - Feb 2007

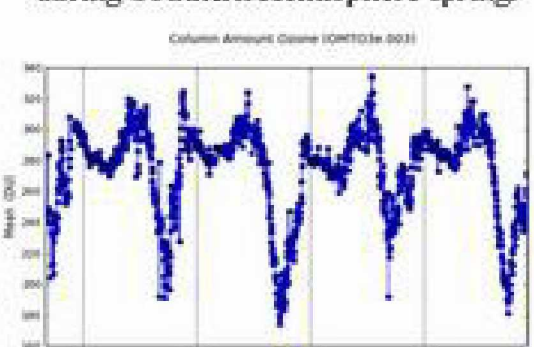
## Exploring Aura Data with Giovanni:

Giovanni is an online interactive web-based data exploration tool developed by the GES DISC. Giovanni allows users to view spatial and temporal variability, as well as vertical structure of ozone and major atmospheric trace gases from Aura OMI, MLS and HIRDLS, as well as other satellite sensors and models (TES data will be added in the future). Giovanni capabilities include creating spatial maps, animations, cross-sections, correlations, time series analysis, and importing data into external applications, such as Google Earth. Data can be downloaded in several file formats (ASCII, HDF, netCDF, KMZ) for further analysis (<http://giovanni.gsfc.nasa.gov>).

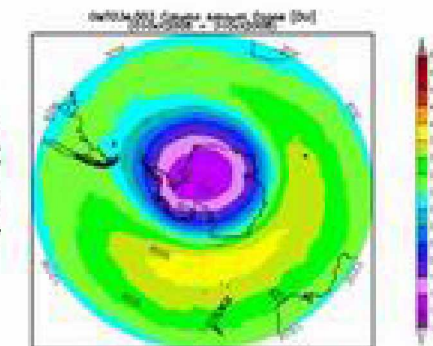
### OMI L3 Instance



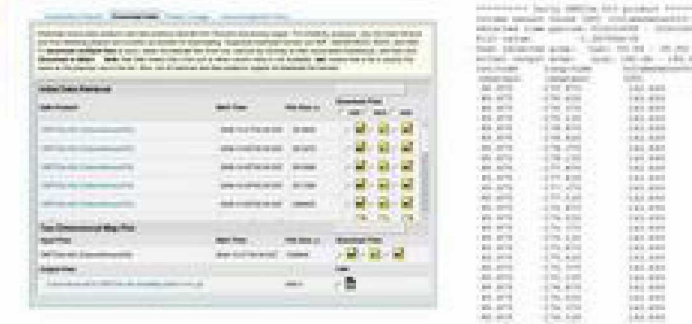
Four year time series of OMI column ozone (TOMS-based algorithm) over Antarctica showing the ozone minima during Southern Hemisphere spring.



South polar projection plot of most recent ozone hole for 2008.

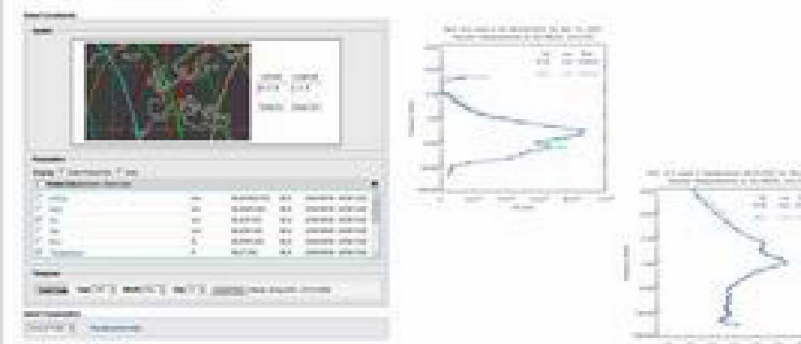


Giovanni now supports output in various file formats including ASCII, HDF, netCDF, and KMZ (at right).



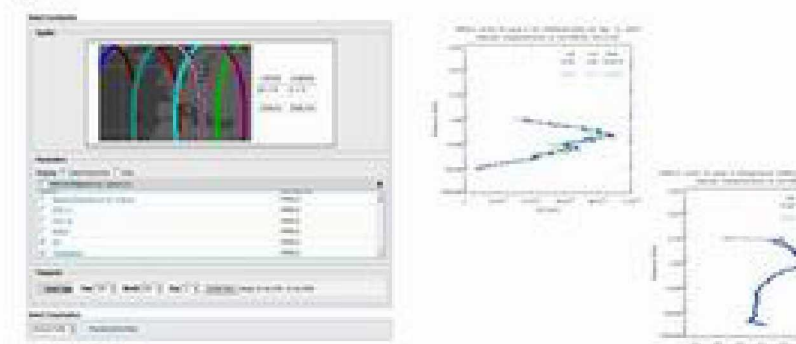
### MLS Instance

Vertical profiles for MLS v2.2 data can be plotted using Giovanni. Here we examine a tropopause fold event over Western Europe.



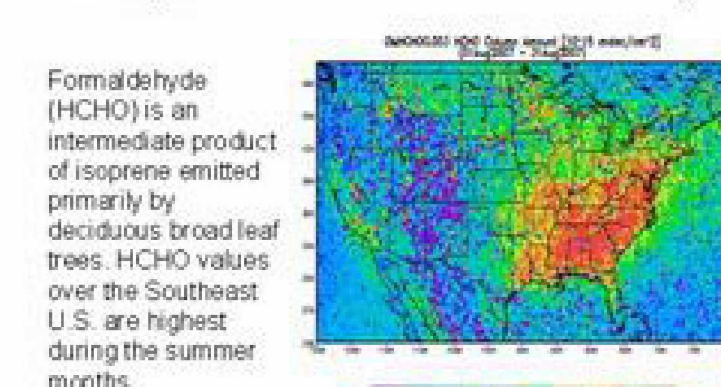
### HIRDLS Instance

Same event viewed with HIRDLS v2.04.19 data. Note that on the ascending orbit, HIRDLS views near the previous/earlier orbit of MLS.

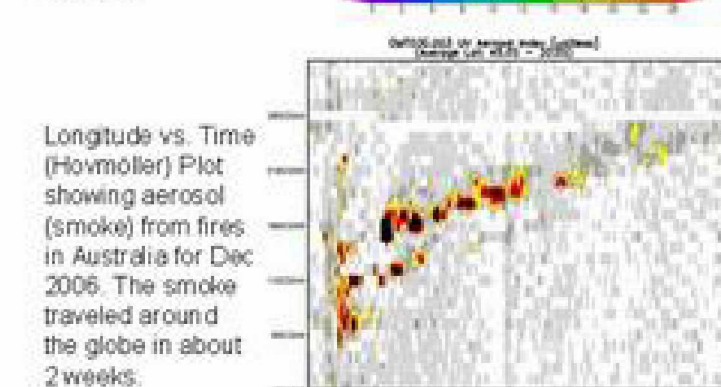
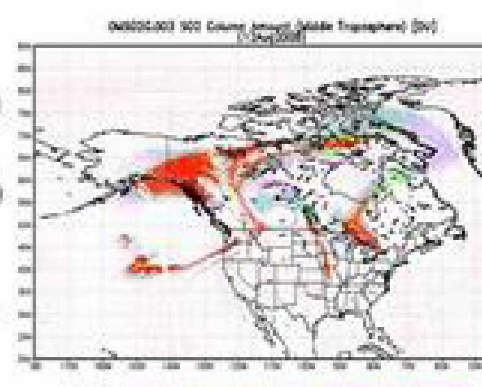


## OMI L2G Instance

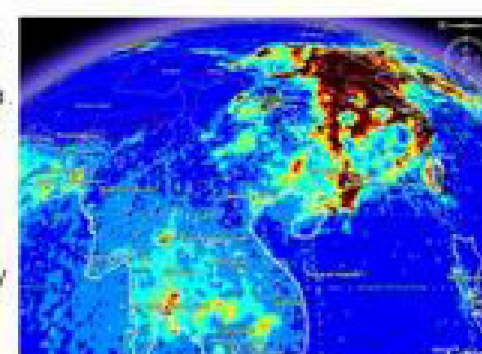
OMI Level-2G daily global products contain an entire day of Level-2 high resolution data (~15 orbits) binned into 0.25° x 0.25° grids. All information (e.g. Time Stamp, Latitude, Longitude, Viewing Angles, Data Quality Flags, etc.) from the original Level-2 pixels are preserved. Users have the ability to filter the data based on data quality flags and other parameters which affect the algorithm in retrieval accuracy.



Area Map showing column SO<sub>2</sub> from the eruption of Mt. Kasatochi (Alaska) in August 2008. The SO<sub>2</sub> cloud drifted eastward over several days.

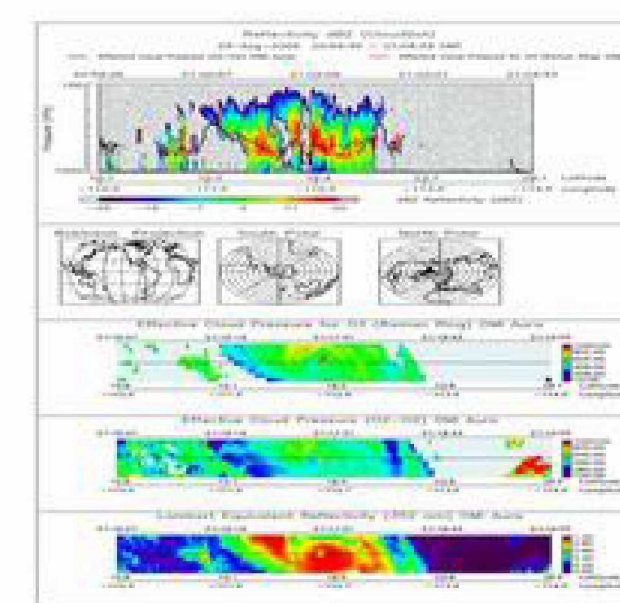


Tropospheric NO<sub>2</sub> shows polluted regions over China. Levels are highest during the winter months.



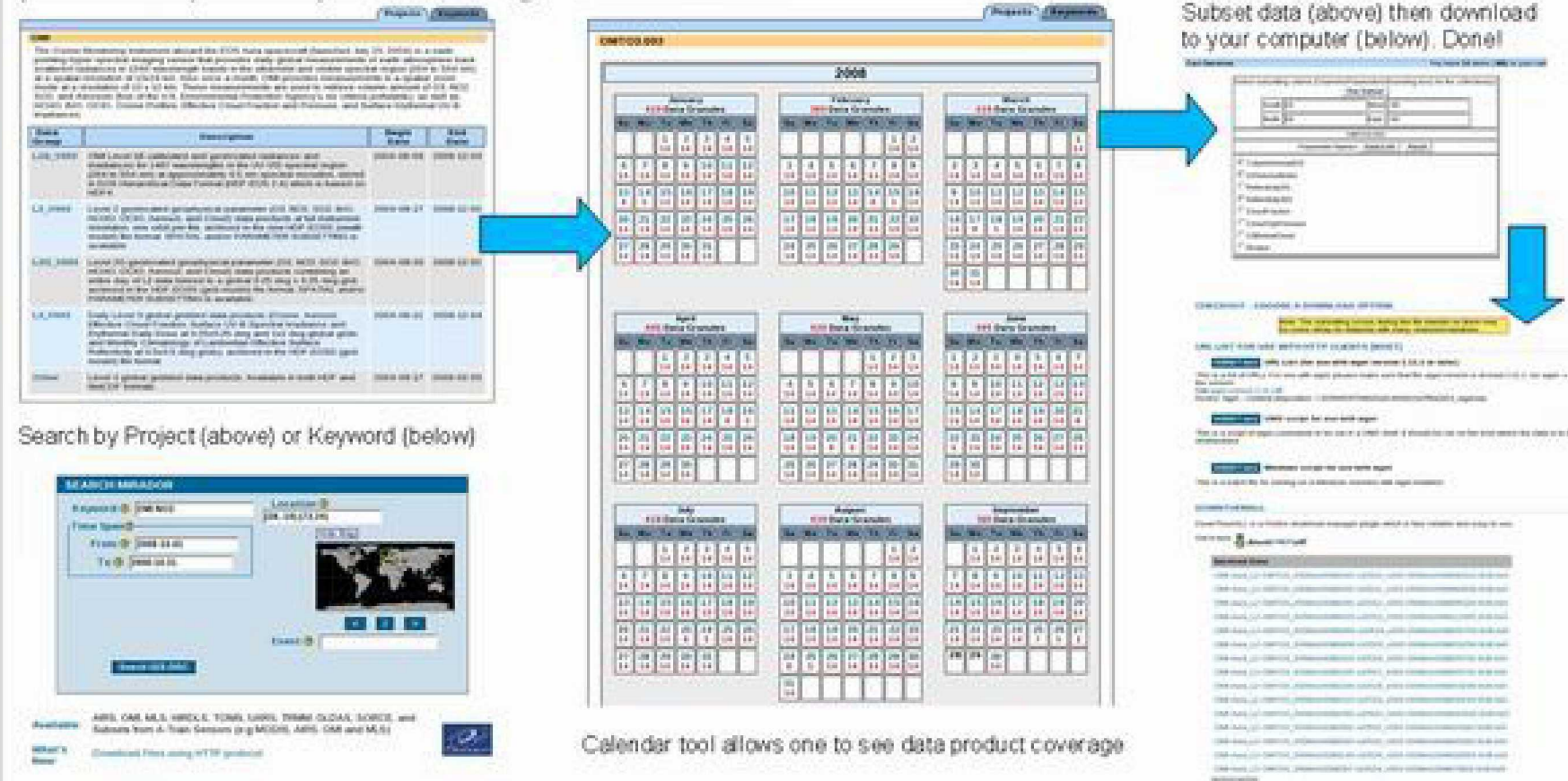
## Aura Data in A-Train Instance

The A-Train is comprised of a series of instruments on several satellites measuring the atmosphere along the same flight path (about 1:30PM ascending crossing time). The A-Train Giovanni instance includes data from CloudSat, CALIOP, AIRS, OMI, MLS and MODIS subsetting along the CloudSat track that can be used for comparative studies.



## Accessing Aura Data:

**Mirador** allows users to locate and download data from the GES DISC. There are now two ways to search data, by project (e.g. OMI) or by keyword (free text). Data files are added to a shopping cart, and can then be downloaded. Value added services, such as interactive subsetting and file format conversion, are available for some products (see <http://mirador.gsfc.nasa.gov>).



**OPeNDAP** has a new handler which supports Aura HDF-EOS5 Grid formatted data files. Users can now transparently subset and download data through OPeNDAP enabled clients (e.g. IDL, MatLab, GrADS).

